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July 10, 1954

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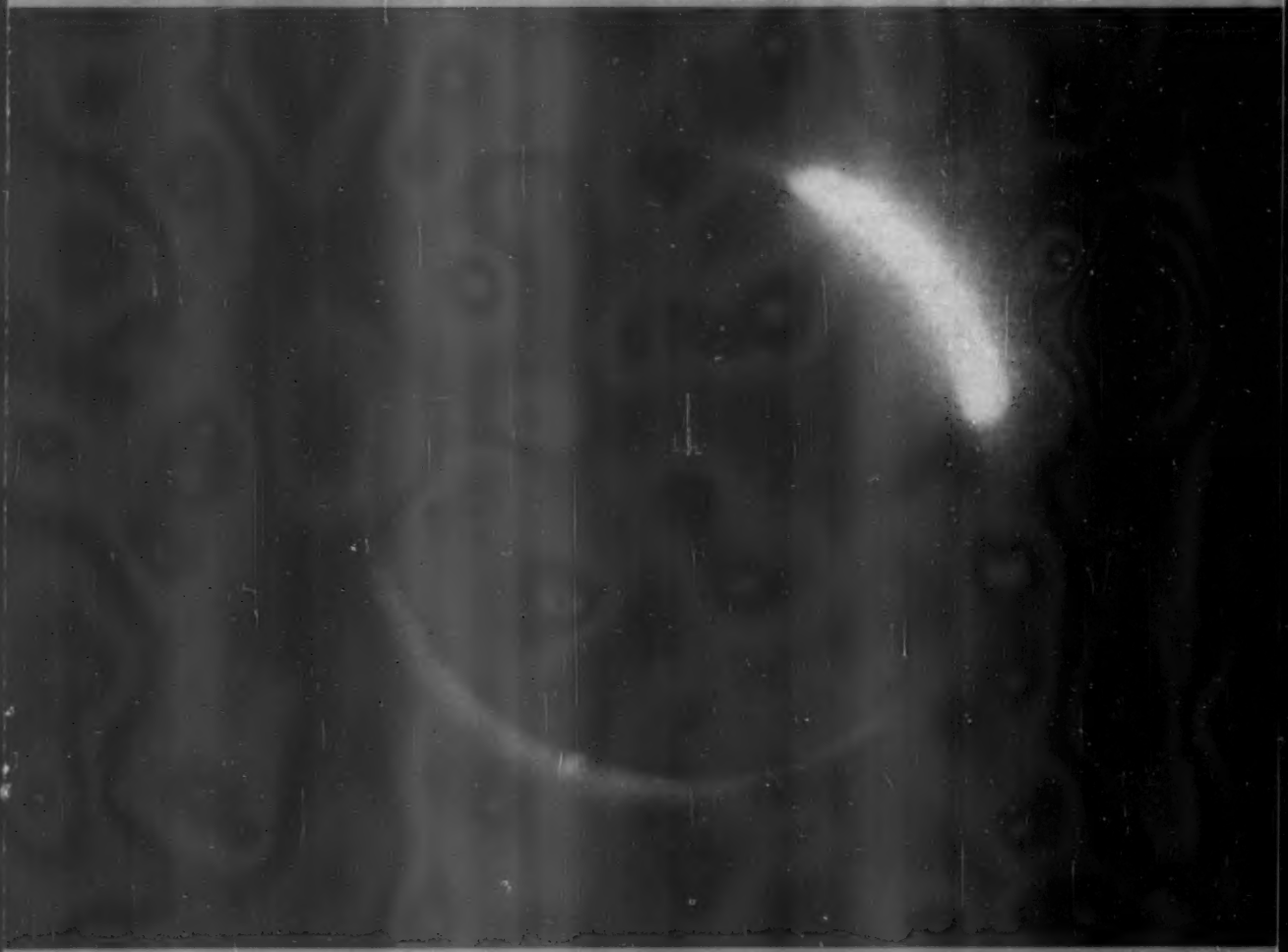
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Celestial Diamond Ring

See Page 21

A SCIENCE SERVICE PUBLICATION

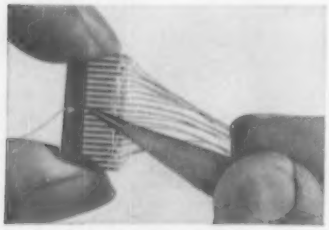
Kodak reports to laboratories on:

the most sensitive lead sulfide photoconductive cell available...
keeping bronzing lacquers from gelling

Ektron detectors

We are going to stop being coy about it and come right out and say that a certain manufacturer of materials for "chemical photography" whose name appears at the bottom of this page is now also manufacturing the most convenient device for the *electrical* detection of radiant energy.

It is called the *Kodak Ektron Detector*. It is the most sensitive lead sulfide photoconductive cell presently available. Its response to a 2500 K tungsten light source is about the same as that of a red-sensitive gas-filled phototube of comparable sensitive area under comparable conditions. But vibration doesn't bother it, for it consists merely of a prepared surface, operating right out in the open. Even more important, the sensitive surface can be of any size or shape. The 20 little black dots on this ¼-inch slip of glass, for example, are individual photoconductive cells.



So far you've read only half the story, possibly the less significant half. Though the *Kodak Ektron Detector* competes with the phototube and photomultiplier on their home grounds in the visible spectrum, it reaches its maximum sensitivity at 2μ in the infrared. At 2.7μ, operating at room temperature, it gives a hundred times the response of a good laboratory bolometer. All in all, the useful response extends from 0.3μ in the ultraviolet to 3.5μ in the infrared. Usable frequency response is from steady illumination to 5,000 radiation pulses per second.

Two of the biggest vistas that open up:

1) Rugged, low-cost switching in which light replaces moving parts. Better yet, forget about visible light and operate your source cool enough to last just short of forever.

2) Simple automatic control for the process industries, based on the characteristic near-infrared absorbance bands of your process liquid, gas, or solid. (Even manufacturers of laboratory spectrophotometers have been turning to *Kodak Ektron Detectors* because where else can they get such high gain out to 3.5μ?)

This thing is more than a gleam in our eye. We are in production and can accept orders today. You transact your business with a man named W. F. Swann at Eastman Kodak Company, Rochester 4, N. Y. He can tell you about the various structural types of Kodak Ektron Detectors, *the many sizes and shapes in which we make them, and the story on matched sets and multiple-detector units. Figure from $14 to $24 apiece for the various standard* Kodak Ektron Detectors *you'll need for working out your ideas. We can talk later about quantity prices.*

For gilt

Cellulose acetate butyrate is our pigeon. The fortunes of war and commerce during the past century have often revolved around the results of modifying cellulose chemically. In our own case, it was a happy day when first we looked into the possibilities of introducing butyryl groups among the acetyls in cellulose acetate. That was quite a while ago. Ever since, we have been investigating the dickens out of all possible ratios of acetyl, butyryl, and native hydroxyls on the cellulose structure. The latest facet of our latest triumph concerns bronzing lacquers.

Have you ever found that a can of such stuff, carefully stoppered at the end of work, has turned to a useless jelly overnight? Such is the exasperating way of cellulose nitrate when it serves as a carrier for metal powder.

Now, in the beaker at the right is some lacquer made instead with a new low-viscosity cellulose acetate butyrate we call *Half-Second Butyrate* (from the length of time taken by a standard ball to fall through a standard length of a standard solution of the ester). Both it and its nitrate-based equivalent on the left were prepared 24 hours before the picture was made and treated alike.

This is nothing. We have in one of our laboratories a durable lacquer made with *Half-Second Butyrate* as the powder vehicle over a year ago and given every opportunity to gel under the standard procedure for this sort of test. It hadn't gelled yet at last report.

Though steam radiators are not as common as they used to be, the market for bronzing lacquers remains healthy. Furthermore, the new Half-Second Butyrate *has bright prospects for the high strength and flexibility of its films down to low temperatures, for its low flammability, color retention, and resistance to ultraviolet. It is the only film former with such characteristics that sprays easily. Eastman Chemical Products, Inc., Chemicals Division, Kingsport, Tenn. (Subsidiary of Eastman Kodak Company), will be pleased to send data on formulation for paper lacquers, plastic lacquers, wood lacquers, metal lacquers, heat-sealing adhesives, melt coatings for both cloth and paper.*

Prices quoted are subject to change without notice.

This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are . . . *serving laboratories everywhere*

Kodak
TRADE MARK

GENERAL SCIENCE

AEC Security Decision

Concepts of security discussed in opinions as four AEC commissioners deny Dr. J. Robert Oppenheimer's security clearance while Dr. Smyth finds him both "loyal and secure."

➤ THE ATOMIC Energy Commission's punch at Dr. J. Robert Oppenheimer will resound throughout the scientific world. Its four-to-one decision that he shall fall by his associations rather than be recognized for his aid in creation of the bomb (the prime reason for the AEC existence) will stir many citizens, even those who are not scientists.

The AEC muffed a chance to remedy what the relatively conservative American Chemical Society weekly, *Chemical and Engineering News* (June 21), calls "horribly inept" handling of the Oppenheimer case "jeopardizing our national safety and well-being."

The AEC majority statement goes far beyond the majority report of its investigating board. Stressing continued "association" with persons they consider suspect, the anti-Oppenheimer commissioners uphold what has come to be known as "negative security."

The majority opinion by Chairman Lewis L. Strauss, Eugene M. Zuckert and Joseph Campbell denied Dr. Oppenheimer's access to restricted data "because of proof of fundamental defects in his 'character'" and because "his associations with persons known to him to be Communists have extended far beyond the tolerable limits of prudence and self-restraint."

Separate, Concurring Opinion

A concurring opinion by Commissioner Thomas E. Murray branded Dr. Oppenheimer as "disloyal" and charged him with being "seriously deficient in his cooperation with the workings of the security system."

Commissioner Zuckert stated that the evidence which convinced him that Dr. Oppenheimer's employment was not warranted on security grounds "did not justify an accusation of disloyalty."

Commissioner H. D. Smyth in his minority dissent argued that security risk should be judged on whether a person "will intentionally or unintentionally reveal secret information to persons who should not have it." Dr. Oppenheimer is not a security risk by this test, in Dr. Smyth's opinion.

It is not mere accident that the scientist on the personnel security board (Dr. Ward V. Evans, Loyola University chemist) and the scientist among the commissioners (Dr. H. D. Smyth, author of the famous 1945 report on the A-bomb) were the two who upheld Dr. Oppenheimer.

Scientists may be expected to shy away further from the service to their nation so badly needed to keep us in the forefront of scientific and technologic development.

It has been rumored that Dr. Smyth intends to resign from the AEC and his scientific friends will understand if he does. But some among them will urge him to continue to raise an expert dissenting voice so that the scientific attitude that is being ignored may have a spokesman, even one who is outvoted.

Excerpts From Smyth's Dissenting Opinion

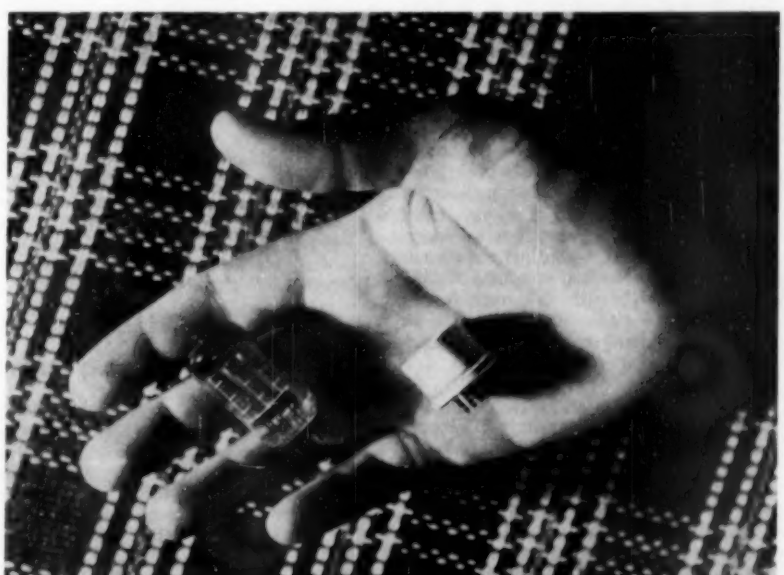
➤ I DISSENT from the action of the Atomic Energy Commission in the matter of Dr. J. Robert Oppenheimer. I agree with the "clear conclusion" of the Gray Board that he is completely loyal and I do not believe he is a security risk. It is my opinion that his clearance for access to restricted data should be restored.

In a case such as this, the Commission is required to look into the future. It must determine whether Dr. Oppenheimer's continued employment by the Government of the United States is in the interests of the people of the United States. This prediction must balance his potential contribution to the positive strength of the country against the possible danger that he may weaken the country by allowing important secrets to reach our enemies.

Since Dr. Oppenheimer is one of the most knowledgeable and lucid physicists we have, his services could be of great value to the country in the future. Therefore, the only question being determined by the Atomic Energy Commission is whether there is a possibility that Dr. Oppenheimer will intentionally or unintentionally reveal secret information to persons who should not have it. To me, this is what is meant within our security system by the term "security risk." Character and associations are important only insofar as they bear on the possibility that secret information will be improperly revealed.

In my opinion the most important evidence in this regard is the fact that there is no indication in the entire record that Dr. Oppenheimer has ever divulged any secret information. The past 15 years of his life have been investigated and reinvestigated. For much of the last 11 years he has been under actual surveillance, his movements watched, his conversations noted, his mail and telephone calls checked. This professional review of his actions has been supplemented by enthusiastic amateur help from powerful personal enemies.

After reviewing the massive dossier and after hearing some forty witnesses, the Gray Board reported on May 27, 1954, that Dr. Oppenheimer "seems to have had a high degree of discretion reflecting an unusual ability to keep to himself vital secrets." My own careful reading of the complete dossier



STACKED TUBES—A conventional vacuum tube, left, is shown here beside a "stacked tube" in a ceramic envelope, both using the same size, 9-pin miniature basing. The stacked tube is less than half the height of the conventional tube. The new tube is also very rugged.

and of the testimony leads me to agree with the Gray Board on this point. I am confident that Dr. Oppenheimer will continue to keep to himself all the secrets with which he is entrusted.

The most important allegations of the General Manager's letter of December 23 related to Dr. Oppenheimer's conduct in the so-called H-bomb program. I am not surprised to find that the evidence does not support these allegations in any way. The history of Dr. Oppenheimer's contributions to the development of nuclear weapons stands untarnished.

It is clear that Dr. Oppenheimer's past associations and activities are not newly discovered in any substantial sense. They have been known for years to responsible authorities who have never been persuaded that they rendered Dr. Oppenheimer unfit for public service. Many of the country's outstanding men have expressed their faith in his integrity.

In spite of all this, the majority of the Commission now concludes that Dr. Oppenheimer is a security risk. I cannot accept this conclusion or the fear behind it. In my opinion the conclusion cannot be supported by a fair evaluation of the evidence. . . .

With respect to the alleged disregard of the security system, I would suggest that the system itself is nothing to worship. It is a necessary means to an end. Its sole purpose, apart from the prevention of sabotage, is to protect secrets. If a man protects the secrets he has in his hands and his head, he has shown essential regard for the security system.

In addition, cooperation with security officials in their legitimate activities is to be expected of private citizens and government employees. The security system has, however, neither the responsibility nor the right to dictate every detail of a man's life. I frankly do not understand the charge made by the majority that Dr. Oppenheimer has shown a persistent and willful disregard for the obligations of security, and that therefore he should be declared a security risk. No gymnastics of rationalization allow me to accept this argument. If in any recent instances, Dr. Oppenheimer has misunderstood his obligation to security, the error is occasion for reproof but not for a finding that he should be debarred from serving his country. Such a finding extends the concept of "security risk" beyond its legitimate justification and constitutes a dangerous precedent.

In these times, failure to employ a man of great talents may impair the strength and power of this country. Yet I would accept this loss if I doubted the loyalty of Dr. Oppenheimer or his ability to hold his tongue. I have no such doubts.

I conclude that Dr. Oppenheimer's employment "will not endanger the common defense and security" and will be "clearly consistent with the interests of the national security." I prefer the positive statement that Dr. Oppenheimer's further employment will continue to strengthen the United States.

Zuckert Discusses Security Risk

▶ ONE OF the difficulties in the development of a healthy security system is the achievement of public understanding of the phrase "security risk." It has unfortunately acquired in many minds the connotation of active disloyalty. As a result, it is not realized that the determination of "security risk" must be applied to individuals where the circumstances may be considerably less derogatory than disloyalty. In the case of Dr. Oppenheimer, the evidence which convinced me that his employment was not warranted on security grounds did not justify an accusation of disloyalty.

The "security risk" concept has evolved in recent years as a part of our search for a security system which will add to the protection of the country. In that quest, certain limited guidelines have emerged. With respect to eligibility of people for sensitive positions in our government we have said, in effect, that there must be a convincing showing that their employment in such positions will not constitute a risk to our security. Except in the clearest of cases, such as present Communist membership, for example, the determination may not be an easy one. In many cases, like the one before us, a complex qualitative determination is required. One inherent difficulty is that every human being is to some degree a security risk. So long as there are normal human feelings like pain, or emotions like love of family, everyone is to some degree vulnerable to influence, and thus a potential risk in some degree to our security.

Under our security system it is our duty to determine how much of a risk is involved in respect to any particular individual and then to determine whether that risk is worth taking in view of what is at stake and the job to be done. It is not possible, except in obvious cases, to determine in what precise manner our security might be endangered. The determination is rather an evaluation of the factors which tend to increase the chance that security might be endangered. Our experience has convinced us that certain types of association and defects of character can materially increase the risk to security. . . .

Scientists See Nation Less Secure in Long Run

▶ THE ATOMIC Energy Commission's decision to deny Dr. J. Robert Oppenheimer's security clearance may make this country less secure in the long run. This was the opinion of at least eight scientists and former Atomic Energy Commissioners, some of whom would not speak for quotation.

When informed of the four-to-one decision, Gordon Dean, former AEC chairman, said, "The country is not any more secure now and I am afraid that, in the long run, it will be less secure."

Dr. Hans Bethe of Cornell University, in a statement made prior to his departure for England last week for publication at the time of the AEC decision, said that he hoped scientists would not resign if Oppenheimer's security clearance was denied.

"This would be very sad," he stated. "I would much rather see them stay in government advisory positions and work for what they believe."

At the Institute for Advanced Study, Dr. Albert Einstein and 26 other permanent members and professors emeriti stated, for the first time publicly, their "complete confidence" in Oppenheimer. They said:

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"We, who have known him as a colleague, as director of our institution, and as a neighbor in a small and intimate community, had from the first a complete confidence in his loyalty to the United States, his discretion in guarding its secrets and his deep concern for its safety, strength and welfare. Our confidence in his loyalty and patriotic devotion remains unimpaired as our admiration for his magnificent public service is undiminished."

They noted that Oppenheimer was also serving his country in a "less conspicuous" manner that is of "great significance" by directing with "inspired devotion" the work of the Institute.

Those signing included Harold F. Cherniss, Ernest H. Kantorowicz, Benjamin D. Meritt, Erwin Panofsky, Homer A. Thompson, E. L. Woodward, Deane Montgomery, Marston Morse, Abraham Pais, Atle Selberg, John von Neumann, Hassler Whitney, Hetty Goldman, E. A. Lowe, Walter W. Stewart, Kurt Weitzmann, James W. Alexander, Julian H. Bigelow, Freeman J. Dyson, Kurt Godel, Herman H. Goldstine, George Palczek, Oswald Veblen, Hermann Weyl, and Chen Ning Yang.

Oppenheimer Issues Short Statement

Oppenheimer issued the following statement after receiving a copy of the AEC decision:

"I have seen the release of the AEC. Dr. Smyth's fair and considered statement, made with full knowledge of the facts, says what needs to be said.

"Without commenting on the security system which has brought all this about, I do have a further word to say. Our country is fortunate in its scientists, in their high skill, and their devotion.

"I know that they will work faithfully to preserve and strengthen this country. I hope that the fruit of their work will be used with humanity, with wisdom and with courage.

"I know that their counsel when sought will be given honestly and freely. I hope that it will be heard."

Science News Letter, July 10, 1954

ASTRONOMY

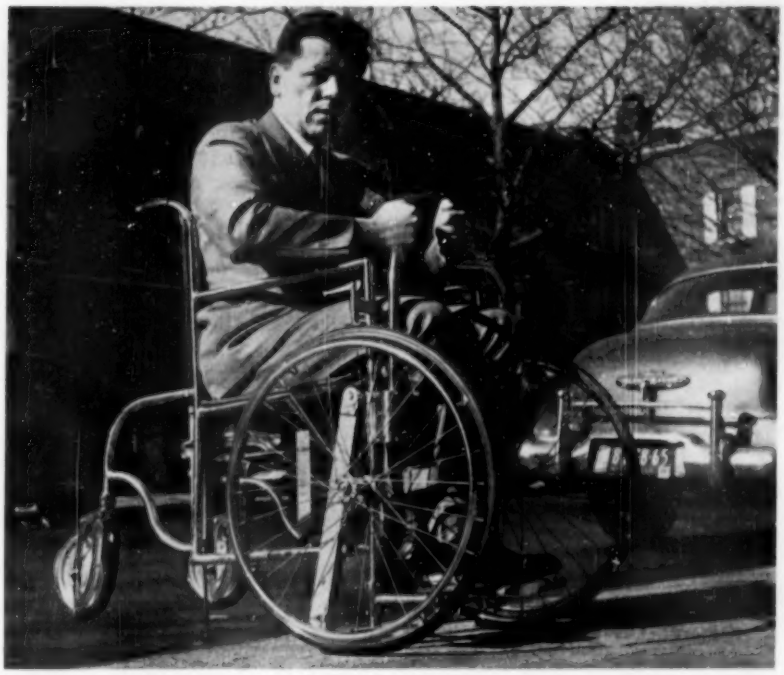
Total Eclipse Seen by Millions

See Front Cover

► JUST AN instant before the moon blacked out the sun during the total eclipse on June 30, hundreds of thousands of people on both sides of the Atlantic saw with their own eyes the most beautiful diamond ring in the world, pictured on the cover of this week's SCIENCE NEWS LETTER.

Millions of others viewed the celestial show on television and movie screens. Many astronomical observations, however, were frustrated by bad weather along a good part of the totality path.

Science News Letter, July 10, 1954



CURB-HOPPING WHEELCHAIR—With this new wheelchair, the invalid can get up and down curbs without requiring aid.

INVENTION

Wheelchair Climbs Curbs

► A CURB-CLIMBING wheelchair has been invented to free invalids from the embarrassment and inconvenience of having someone with them when they take a roll through the park.

Requiring no more force to mount a curb than it does to travel on level ground, the wheelchair would cost only 30% more than ordinary wheelchairs on a production basis.

This was the finding of engineers in the research division of New York University's College of Engineering who developed the chair for the National Foundation for Infantile Paralysis.

The model demonstrated was the "offspring" of three false starts. The first chair borrowed a pole-vaulting technique. When wheeled to the curb at seven feet a second, two rods sprang out at the right time to leapfrog the chair from road to curb. This model was rejected because it was easily tipped over, it put its user at a psychological disadvantage and it made a lot of noise.

The second prototype used a complicated mechanism involving piston rods. It cost too much, it was too complex and it "looked like a miniature locomotive," criticized Leon Bennett, who was one of the research engineers.

Then he and co-designers Renato Contini, William Murray and Herbert Tramposch worked up the third version that depended upon expensive hydraulic jacks which signed this model's death warrant.

However, with the last model came the germ of an idea that grew into the present wheelchair. It uses a "block-and-tackle" principle that gets the patient up on a curb in less than a minute.

All the invalid has to do is touch the curb with his front wheels, press the operating handles on each armrest and turn them three times. Two steel rods jack up the front of the wheelchair. Then he moves forward slightly and twists the handles in the other direction to jack up the rear wheels.

Science News Letter, July 10, 1954

ASTRONOMY

Very Faint Comet Spotted in Corona

► A VERY faint comet has been discovered in the constellation of Corona, the crown, now directly overhead, by Robert G. Harrington of Mt. Wilson and Palomar Observatories in California, Harvard College Observatory has reported. The comet was spotted on June 24 and is of magnitude 19, much too faint to be seen except with the very largest telescopes.

Science News Letter, July 10, 1954

GENERAL SCIENCE

Red China's Michurinism

► "MICHURIN SAY" may replace "Confucius say" in Communist China.

Michurinism is now the canon of science in Chinese Communism, Dr. Alfred Zee Chang reports in *Science* (June 4). Dr. Chang, who lives in Washington, is engaged on research on Chinese society for the Center for International Studies of the Massachusetts Institute of Technology.

"The Communists worship the Russian horticulturist (Michurin) in a way the Chinese used to do honor to Confucius," Dr. Chang says. "There are Michurinian associations and experimental stations throughout the China mainland, and the practice of Michurinism is not confined to biological science alone.

"It is understandable in the Western world that when Michurinists are dominant, the usefulness of modern scientists is doomed."

Michurin is the "Burbank" of Russia, with many new varieties of fruit to his credit. He is the symbol of the value placed on practical applications of plant breeding to benefit the state as opposed to "pure science" research.

The Chinese Academy of Science has been reorganized by the Communists under the presidency of Marxist litterateur Kuo Mo-ju. Although the Communists seem well aware of the importance of scientific development to the Communist regime, they do not seem to have made much headway in wooing over the leading Chinese scientists or in the training of young scientific personnel.

The overemphasis of political training gave no room for any serious scientific study, Dr. Chang points out.

Most of the 50 scientists in the "Ko-lien" or All-China Association for Natural Sciences are leading scientists who received their training overseas. Twenty-three are known to have trained in the United States, four in Great Britain, three in Japan, two in France and one in Canada. Thus they are in contrast to the foreign-educated Communist leaders who were mostly schooled in the Soviet Union, France and Japan.

Nevertheless, Dr. Chang states that "the Communists have little appreciation of the talents and ability of leading scientists. In fact, these scientists, with their objective method of reasoning, represent a potential threat to Communism. All that stands between the scientists and their eventual euthanasia at the hands of the Communists is their immediate usefulness in technical matters and their congenital nonaggressiveness."

Since the "Anti-America-Aid-Korea Campaign" and later "Anti-Three and Anti-Five Movements," leading scientists in China have been treated ruthlessly in certain isolated cases. Self-criticism and ridiculous "confessions" have been written by scientists and made public in newspapers.

"At least one outstanding scientist," Dr. Chang said, "Chicago-trained Dr. Lo Chih-wei, was definitely liquidated in March, 1952, because of his refusal to sign an anti-American declaration."

Science News Letter, July 10, 1954

MEDICINE

Diagnosing Diseases

► A METHOD for diagnosing diseases by changes in blood serum proteins won a prize in the exhibit section of the American Medical Association, San Francisco.

The method was developed and shown by Drs. Gerald R. Cooper and Emanuel E. Mandel of the Public Health Service's Communicable Disease Center and Emory University School of Medicine, Atlanta, Ga.

The diagnoses are made by determining the change in migration of charged particles through an electric field. This is called electrophoresis. Heretofore, expensive optical devices and complicated manipulations have been needed to detect blood serum protein changes by methods using electrophoresis.

It was all so complex that a $3200-a-year technician was needed to run the machine. It had to be reserved for research purposes and, as Dr. Cooper said, "We doctors found ourselves studying the machine, not the disease."

He and Dr. Mandel have worked out a method of getting the same information from apparatus simple enough and cheap enough to be used in the hospital clinical laboratory.

Filter paper and a machine adapted from the motion picture industry, called a film densimeter, are important parts of the new method.

Diseases that can be diagnosed with it are: multiple myeloma, in which tumors form in many places in the body; cirrhosis of the liver, including that following the now prevalent jaundice condition, hepatitis; several kinds of kidney disease; and probably the extremely rare ailment in which the blood is entirely lacking in gamma globulin, which carries protective antibodies against polio and other infectious diseases.

Besides its aid in diagnosis, Dr. Cooper explained that the method will help doctors watch what is going on in their patients, see how a disease is progressing, and follow results of treatment.

As a research tool, the new electrophoretic method should give clues to the mechanisms of diseases and consequently to their possible cures.

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• RADIO

Saturday, July 17, 1954, 3:15-3:30 p.m. EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Frederick A. Aldrich, instructor in zoology, Rutgers University, the State University of New Jersey, New Brunswick, will discuss "Starfish."

GEOLOGY

Ask Australians to Seek Uranium on Holidays

► HOLIDAY AND weekend prospectors are being asked to aid a nation-wide search for uranium in New Zealand.

The government has enlisted their assistance because of the magnitude of the job. Officials of the Scientific and Industrial Research Department believe gold-bearing sands of the West Coast may yield results.

Science News Letter, July 10, 1954

ANTHROPOLOGY

Lop Man-Apes From Man's Family Tree

► THE MAN-APES of South Africa may not have been ancestors to modern man.

The possibility that the Australopithecinae may be lopped off man's family tree, or at least pushed down to an "uncle's" location, is pointed out by Dr. William L. Strauss, of Johns Hopkins University in *Science* (June 18).

His suggestion is based on results of a recent research tour through South Africa made by Dr. Kenneth P. Oakley of the British Museum and reported to the American Association of Physical Anthropologists. Dr. Oakley is one of the British scientists who recently denounced the famous Piltdown Man as a hoax.

On the basis of personal direct observation of the sites where the fossil man-ape bones have been found, Dr. Oakley concludes that the Australopithecinae were not tool-makers and were not old enough geologically to be ancestors of the first tool-making hominids.

It is more likely, he believes, that the Australopithecines were living at the same time as did a race of more advanced hominids who did make tools. The tool-makers seem to have lived along the banks of rivers and lakes while the Australopithecines lived in the bushy ravines, or "kloofs" as they are called locally, where they frequently were the victims of meat-eating animals.

The limestone caves in which the remains of the fossil man-apes were found were probably not the homes of these ancient man-apes, Dr. Oakley believes. Instead they were probably occupied by the wild animals who devoured them and left their bones for modern anthropologists to find. The man-ape may have ducked into the cave to take shelter from rain or wind, or he may have been dragged there by his beast attacker.

Science News Letter, July 10, 1954

BRIGHT PICTURES—This new television picture tube shows pictures so bright that they can be viewed even in brilliant sunshine. Harvey O. Hook, RCA research engineer, is shown here studying details of the test pattern on the tube he helped develop. It was produced especially for use in an airplane cockpit or on the bridge of a ship.

ASTRONOMY

Close Approach of Mars

► CLIMAX OF many months of preparation for astronomers was the close approach of Mars on July 2, when the red planet was only 39,740,000 miles away.

Although Mars can be spotted with the naked eye, binoculars afford a much better view especially when away from city lights. Mars and Antares, whose name means "rival of Mars," can both be seen in the southern sky. Facing directly south, they are a little above the horizon about ten at night, Mars on the left and Antares on the right.

The two are now so close together it is easy to compare them, although Mars is considerably brighter.

This year marks the red planet's closest approach to the earth since 1941, but it will come even closer in 1956, a mere 35,000,000 miles, which is very close as astronomical distances go.

From observations made during the present close approach, astronomers hope to establish definitely whether or not there is life on Mars, although not necessarily life as we know it here.

Positive proof that even plant life, such as moss and lichens, can be found on Mars would show that life is not unique to earth. Such a discovery would have tremendous repercussions, since other stars besides the sun quite certainly have planets, and thus they, too, could support a form of life.

Besides astronomers, meteorologists, physicists, biologists, chemists and geologists are taking a close look at Mars from 18 observatories in 10 countries. Their aim is not only to determine the existence of plant life, but to gain more knowledge of Martian atmosphere, climate, size and surface features.

The systematic study is being coordinated by the International Mars Committee, whose secretary is Dr. Albert G. Wilson of Lowell Observatory, Flagstaff, Ariz. At Bloemfontein, South Africa, a special expedition has been studying the nearby planet for more than two months, under the direction of Dr. E. C. Slipher of the Lowell Observatory.

Motion pictures of Mars are being taken with Mt. Wilson's 100-inch telescope by Dr. Edison Pettit and his associates. They hope to solve the riddle of the "canali," or canals, that many astronomers believe they have seen on the Martian surface.

Their aim is to get some photographs at rare moments when the earth's atmosphere is standing still, not dancing and shimmering as it usually does.

The "blue clearing" of Mars has been noted already. The phenomenon is observed only rarely, when the sun, earth and Mars are in near opposition, as they were recently. Only at these times can the Martian surface features be photographed in blue light.

Science News Letter, July 10, 1954

ANTHROPOLOGY

New Instrument Spots Amount of Race Mixture

► SCIENTISTS NOW have a new objective instrument for measuring the amount of race mixture in a population.

A photoelectric reflection meter was used in a town in Mexico to record differences in skin color, evidence of mixture of the Indian population with Europeans. Results are reported by Dr. Gabriel Ward Lasker of Wayne University College of Medicine, Detroit, in the *American Journal of Physical Anthropology* (March).

Skin areas for study were selected so they would be relatively clean, flat, free of dark hair, and available for study without undressing the children. Two areas were picked. A section in the middle of the forehead furnished an area that would show the effects of sun-tanning. A section on the inner surface of the upper arm provided an area not so exposed.

Children between 10 and 20 years old were examined at the federal secondary school in Paracho, Michoacan, in the upper grades of the two federal primary schools, and in a government boarding school for Tarascan Indians.

Boys were found to be darker than girls, but the difference was significant only for the forehead measurement, showing that it is caused because the boys spend more time outdoors in the sun.

Boys attending the school for Indians are the darkest. Children with parents native to Paracho came next, and children whose parents came from elsewhere are lightest.

Science News Letter, July 10, 1954

ENTOMOLOGY

Spider Screens Houses By Spinning Gold Web

► IN PANAMA the natives get their house screened by a spider. The spider obligingly spins its web around the house, covering every crack.

The web is completely insect proof and decorative as well, since it is "like the most delicate sort of golden lace."

For houses of considerable size, hundreds of spiders combine to spin webs which eventually form an almost continuous fabric. The spiders, of course, stay in the web ready to trap any unsuspecting insect which approaches.

The gold-colored spider web house screens were discovered in the Bocas del Toro province of Panama near the Costa Rican border by Dr. Matthew W. Stirling of the Smithsonian Institution, Washington.

The spider has been identified as the species *Nephila clavipes*, which is also found in the Florida Everglades. It has long been known for its sturdy threads that can be woven into cloth. Efforts to domesticate the spider for the threads were made, but did not prove profitable and have been abandoned.

Science News Letter, July 10, 1954

TECHNOLOGY

Hair Analysis Gives Owner's Age and Sex

▶ SCIENTIFIC DETECTIVES now have a new tool to use in identification. Examination of human hair with a polarizing microscope and an instrument called a refractometer can indicate roughly the age and sex of the person from whom the hair came.

This was found in a study of hair taken from the heads of 16 children each month from birth to 20 years. Results are reported in the *American Journal of Physical Anthropology* (March) by Dr. Oliver H. Duggins, anatomist of Washington University, St. Louis, Mo.

First big change in hair comes when the young infant loses his pre-natal hair and gets his first fine baby hair. During the first two years of life, the hair changes rapidly and markedly, Dr. Duggins found.

From the third to the seventh years, the hair, as it shows up under the instruments, remains relatively constant. There are no marked differences between the hair of boys and girls.

After the eighth year, the refractive index of the hair of girls drops sharply and this drop continues up to about age 16. During this period, the refractive indexes of boys' hair also drop, but much more slowly at first. After 16 years, the hair of boys and girls becomes more nearly alike again.

A permanent wave makes a marked change in the characteristics of the hair, but fortunately for the use of this method for identification, use of permanent waves is still uncommon for children, Dr. Duggins said.

Science News Letter, July 10, 1954

AERONAUTICS

Catapult Pitches Cougar Into Air in Navy Test

▶ THE NAVY'S modified Cougar, now being delivered to aircraft carriers, has been successfully pitched into the air by a hydraulic catapult similar in principle to the one on the fire-ravaged U.S.S. Bennington.

Although a brisk crosswind hampered launching, the improved Grumman F9F-8 Cougar climbed into the sky at Patuxent River, Md., while members of the Institute of Aeronautical Sciences watched.

It was the first time that this fighter had been launched from a catapult of any sort, officials of the Naval Air Test Center in Patuxent declared. Later the plane made its first arrested landing on the same runway.

This ground-based runway has been equipped to approximate a carrier's flight deck so that Navy experts can check the suitability of new planes for fleet duty. There is plenty of extra concrete beyond the theoretical end of the mockup "carrier" deck. If a plane fails to become airborne at the end of this "deck," it therefore is spared a dunking.

Neither the Cougar nor the flashy Cutlass climbed into the air before reaching the end of the "deck." But Navy officials pointed out that stronger winds would ordinarily blow at sea, and they would be headwinds, not tricky crosswinds. This would help the planes make successful take-offs.

However, to continue its carrier-launching tests on land, the Navy is installing a modern, more powerful steam-type catapult to handle its newer, heavier planes. Now earmarked for new aircraft carriers, these catapults may be able to hurl planes into the sky at air speeds greater than 120 miles an hour.

The IAS group also was shown water skis now under test. They fit on telescoping legs and contain small wheels that permit the plane to operate also from land.

A spray deflector was needed on the original skis, investigators found. So much water was being thrown into the engines during take-off that large amounts of thrust were lost and many take-offs were aborted.

Science News Letter, July 10, 1954

MEDICINE

"Ideal Treatment" For Obesity Discovered

▶ THE "IDEAL treatment for obesity," a chemical that would let fat people eat without getting overfat, has been discovered. But it may be several years before it can be given to human patients.

This chemical is a hormone made by the pituitary gland in the head. It is called adipokinin, meaning fat burner. Its existence has been suspected for many years. Now Dr. Isadore Nathan Rosenberg of Tufts College Medical School, Boston, has succeeded in extracting it in nearly pure form. For this and other research, Dr. Rosenberg received the Ciba Award of the Endocrine Society at its meeting in San Francisco.

Adipokinin, the fat-burning hormone, comes from a fraction of the pituitary gland that also contains two other hormones, intramedin and ACTH, famous as an arthritis remedy. Intramedin can be separated from the other two relatively easily. The big job still ahead is to get adipokinin completely separated from ACTH, so that it can be given in large doses without also giving ACTH.

Dr. Rosenberg has given the partially pure fat-burning hormone to laboratory animals. In them it has a very striking and rapid effect. It greatly increases the rate at which their bodies burn fat. It is as if the body changed its fuel and burned fat predominantly.

The fat person's lament, "It's my glands that make me fat," may be true after all, Dr. Rosenberg says. Fat people are fat because they eat more than their bodies need. However, he explained, there may be some derangement in their pituitary glands that upsets the balance between production of the fat-burning hormone and the appetite governing mechanism.

Science News Letter, July 10, 1954

IN SCIEN

GENERAL SCIENCE

50 Foreign Scientists Are Denied Visas

▶ AT LEAST 50 foreign scientists have been refused visas in the last two years, SCIENCE SERVICE has learned. The total is probably many times this number, since only a small percentage of the visas denied are heard about in the United States.

These 50 or more foreign scientists are all top men in their fields, including some who have won Nobel prizes. Refusal of their visa applications for unspecified reasons is tearing down the U. S. reputation for democracy and fair play abroad, scientists who have visited European laboratories report.

The most recent example is that of Dr. P. A. M. Dirac. (See SNL, June 5, p. 357.) However, there are other scientists equally as eminent in other fields, who likewise have previously visited the United States, who are now barred.

Scientists and others high in government advisory councils have expressed deep concern that such bans are an example of a drive toward "negative security." Negative security, they believe, can result only in harm to this country if continued over a period of time. Eventually, they charge, sterility of ideas would result.

Science News Letter, July 10, 1954

BACTERIOLOGY

Two New Techniques to Track Brucellosis Germs

▶ GERM DETECTIVES have devised two new techniques to track down the elusive organisms that cause brucellosis.

One method involves sugar fermentation by the organisms. Textbooks say that brucella do not ferment sugars. The scientists have established that all species ferment some types of sugars and have been able to identify them by the sugars they ferment.

Another method distinguishes among closely similar species through varying sensitivity to certain dye tablets. Tablets are placed on culture plates with brucella colonies. Degree of sensitivity is indicated by size of the area around the tablet where bacteria do not grow. It varies markedly from species to species.

The studies on brucellosis are being made by Dr. John Pickett and Dr. Eric Nelson of the University of California at Los Angeles.

Their research is part of a long-range effort to develop better techniques of tracing the bacteria to their animal sources. These bacteria, which may be responsible for many vague, undiagnosed ills, are difficult to identify by usual laboratory methods.

Science News Letter, July 10, 1954

CE FIELDS

ASTRONOMY

Binoculars Show Galaxy Size Better Than Photos

▶ GOOD BINOCULARS will show you the size of the Great Nebula in Andromeda better than photographs, Dr. Robert Jonckheere of Marseilles Observatory in France has reported to the Royal Astronomical Society in London.

Andromeda, or M-31 as it is known to astronomers, is a pinwheel of stars in our local family of galaxies and the spiral galaxy that is closest to our own Milky Way.

Dr. Jonckheere made the "very remarkable" discovery that binoculars could be used to measure the full size of Andromeda Nebula in the winter of 1952-53. He waited to confirm it this past winter before announcing it now.

The Andromeda Nebula, 1,500,000 light years from the earth, is the brightest of the spiral systems of galaxies and visible as a hazy patch to the naked eye. It is located in the constellation of Andromeda, visible in the northeast just to the right of Cassiopeia's familiar W.

Measuring such a far away galaxy with binoculars more accurately than with photographs shows that the eye "is indeed wonderfully sensitive," Dr. Jonckheere stated.

To see the full size of Andromeda, Dr. Jonckheere warned, the eyepieces of the binoculars must be "very carefully centered on the eyes so that both pupils are fully used." You should remain in darkness, with your eyes open, for at least 10 minutes before looking at the galaxy, and be completely excluded from external light.

"The view of the nebula through such binoculars will then well repay the care taken," Dr. Jonckheere promises in *The Observatory* (April).

Science News Letter, July 10, 1954

ASTRONOMY

Suggest Venus Has Surface of Oceans Only

▶ EARTH'S NEAREST neighbor in the sky, the planet Venus, may have a surface completely covered by oceans, Drs. Donald H. Menzel and Fred L. Whipple of Harvard College Observatory reported to the American Astronomical Society meeting in Ann Arbor, Mich.

This proposal contradicts earlier suggestions that there is little or no water on that planet, and makes the possibility of life on Venus more plausible than has previously been thought.

The thick cloud layer surrounding Venus has been shown to have the optical properties of terrestrial clouds. Thus it is probably condensed water vapor as are earth clouds.

The temperature of the Venus cloud layer has recently been measured as about minus 38 degrees Fahrenheit by Dr. William Sinton of Johns Hopkins University, using the giant 200-inch Mount Palomar telescope. At this low temperature, the atmosphere above the clouds of Venus is too cold to hold any appreciable water vapor. This, the Harvard astronomers point out, would explain earlier observations that seemed to indicate water vapor was absent from the atmosphere above the clouds.

If the clouds are actually water vapor, there should also be some liquid water on the planet itself. This must cover the whole surface, Drs. Menzel and Whipple conclude, otherwise damp, protruding rocks would soon absorb practically all the carbon dioxide in the atmosphere of Venus. This has not happened, however, for spectroscopic observations prove without doubt that carbon dioxide is very abundant there.

Science News Letter, July 10, 1954

PHYSICS

Use "Cold" Ice for Cool Summer Drinks

▶ FOR TALL cool summer drinks, use ice cubes pried loose from refrigerator trays at the last moment. In this way, you get the full benefit of "cold" ice.

As most people know, ice cools the drink and the drink warms the ice. However, Servel refrigeration engineers in Evansville, Ind., point out that "cold" ice is more efficient for cooling drinks than "warm" ice.

"Cold" ice, taken directly from the freezer section, is at zero degrees Fahrenheit. It cools in two ways when dropped into a drink.

First, it attracts heat from the liquid, thus cooling the drink, while the temperature of the ice rises to 32 degrees. This is known as "sensible heat transfer." At this temperature, the ice then melts, causing a second cooling action, or "latent heat transfer."

Ice kept outside the refrigerator in a bucket or bowl has a temperature close to 32 degrees, so its main cooling action is only by melting.

Ice at zero degrees from the freezer section cools faster and has up to 40% more cooling capacity than ice at 32 degrees from a bucket or bowl, the Servel engineers found.

Science News Letter, July 10, 1954

GENERAL SCIENCE

Students Urged to Enter Careers in Health Work

▶ HIGH SCHOOL graduates have many opportunities to enter careers that will aid the health of the nation, the National Health Council has pointed out in New York. A program is underway to bring to the attention of high school students opportunities to become doctors, nurses, technicians and other health workers to staff the health services of the future.

Science News Letter, July 10, 1954

ENGINEERING

Polonium Freshens Air In Ventilating Systems

▶ SOME DAY window air conditioners or household cooling plants may contain a trace of a rare element to freshen indoor air with invisible, health-stimulating particles of electricity.

J. C. Beckett, chief engineer of the Wesix Electric Heater Co., San Francisco, told the American Institute of Electrical Engineers meeting in Los Angeles that radioactive polonium 210 has been used to generate alpha particles in air conditioning systems.

He described experiments that were aimed at finding a way of processing indoor air so it would not lose its outdoor-air qualities. Polonium, once a hard-to-get member of the sulfur family, was selected because it did not generate any ozone, oxides of nitrogen or hydrogen peroxide.

Currently produced as a by-product of atomic piles, polonium 210 does the same ionizing work as high-voltage discharges and X-rays. However, no ions are formed that would be irritating if inhaled to excess.

Citing studies which tie in the effect of air composition on health, Mr. Beckett said, "Until additional biological experiment can show how to use ion control for relief of specific diseases or ailments, it is necessary . . . to be content with making indoor air like outdoor air at its best, before attempting to improve on the electrical properties of fresh air."

Science News Letter, July 10, 1954

MEDICINE

Muscle Differences Are Possible Dystrophy Key

▶ DISCOVERY OF considerable chemical differences among various muscles in the same person and between the same muscle in the two sexes is announced by Dr. Samuel Leonard of Cornell University, Ithaca, N. Y.

These differences are now being probed in the hope of finding leads for solving the problem of muscular dystrophy and other muscular disorders.

All skeletal muscles look alike under the microscope, Dr. Leonard points out, but when cortisone, famous arthritis hormone remedy, is injected, it causes a large storage of glycogen or "animal starch" in the leg muscles. It does not have an effect on the diaphragm muscle. Cortisone, Dr. Leonard has discovered, increases the glycogen in the belly muscles of a female rat, but has no effect on the same muscles of male rats.

It is very difficult to produce muscular dystrophies in experimental animals, Dr. Leonard explained. Basic research on normal muscles is therefore necessary for understanding muscular disorders in general. To aid his research, the Muscular Dystrophy Associations of America, Inc., has just given Dr. Leonard a $3,000 grant.

Science News Letter, July 10, 1954

SURGERY

Gadgets Save Lives

Shoestrings, staplers, rubber wells and clamps on fakirs' bed-of-nails principle help surgeons in modern miracle operations.

By JANE STAFFORD

▶ GADGETS CAN be life-saving. These are the gadgets surgeons use. Many of the dramatic operations now performed are done more smoothly because of gadgets. Some of these, such as operations on the heart and blood vessels, would not be possible without the gadgets.

Dr. Alfred Blalock of Johns Hopkins Medical School, famed for the "blue baby" operation that has given a new, long lease on life to thousands of small sufferers, recently decried criticism of some newly invented surgical tools by those who scornfully called them "gadgets."

One of these is known as the Potts ductus clamp. When it was first developed by Dr. Willis J. Potts of Chicago, professional surgical and medical journals were not interested in publishing a report about it because it was considered just a gadget. Now surgeons use it so much that the manufacturer has difficulty in supplying the demand.

Army surgeons have credited these clamps with doing a tremendous arm and leg saving job among the wounded during the Korean fighting.

Its value is that it clamps a blood vessel, vein or artery, so that blood does not flow through it and spill out to be lost by the patient. Yet at the same time, the clamp does not damage the delicate blood vessel walls. Consequently when the surgeon has stitched the cut ends of the blood vessel together or has inserted graft of blood vessel, and removes the blood-stopping clamps, the delicate tubes that carry the blood are in good shape to resume their vital function.

Pressure Evenly Distributed

The special feature of these clamps are their 20 very small and perfectly aligned teeth. The teeth of the clamp follow the principle of the bed of nails Indian fakirs lie on without injury. The nails in the bed, and the teeth of the clamps, are so evenly placed there is no undue pressure at any one point and therefore no injury.

Another of Dr. Potts' inventions that some might put in the gadget class is a knife that opens after it has been inserted in a blood vessel.

A recent joke about a surgeon operating on a shoestring is not quite so fantastic as it sounds. Shoestrings, white ones, actually are used by surgeons. They fit over the ends of an instrument called the Foss colon clamp to keep the clamping ends from slipping. Slipperiness is a characteristic of all sorts of body tubes from arteries and veins to the digestive tube of which the colon is a part.

Surgeons, as everyone knows, do a lot of sewing, or stitching, in addition to cutting. The stitches, or sutures, the patient knows about are the ones that close the outside edges of the wound, but many other lines of stitches are taken below the surface of the wound. When a piece of stomach is cut out, for example, the edges of the stomach must be sewed together. And the surgeon may have to sew together the inside wall of the stomach and then the outside wall.

Some of this stomach stitching is now done by an instrument that is, in effect, a stapler. It is known as the Von Petz suturing apparatus and is used for the first suture, or stitch, line in stomach dissections. Its jaws open and then close over the cut pieces that are to be stitched and then a special mechanism releases many tiny metal staples to hold the edges together.

The staples are about the size of those used in offices to hold papers together.

Button Up Hearts

Surgeons can now button up hearts that have holes in them. The holes in such cases are in the wall dividing the two upper blood chambers of the heart, called auricles. These holes are present at birth and are probably the most common of heart malformations in young adults. They can cause a blue baby condition, but are not the only cause of such a condition.

The nylon and Lucite buttons for permanently closing these defects were devised by Dr. Charles A. Hufnagel and associates at Georgetown University School of Medicine, Washington.

Each of these buttons is made in halves

SURGICAL TOOLS—Major Edna Parker, Army Nurse Corps, now stationed at Walter Reed Army Hospital, shows the Von Petz suturing apparatus used in stomach operations. It staples instead of stitching cut ends. Other surgical instruments on tray, left to right, are part of stomach stapler; Potts ductus clamp; bull dog clamp; Bailey-Glover-O'Neil commissurotomy knife; Potts-Smith aortic clamp; Blalock pulmonary artery clamp and the Foss colon clamp (white shoestrings are used over its ends to keep them from slipping).

that fit together something like a snap hook. They are made slightly larger than the hole to be closed. One half is pushed through the heart hole by a special instrument, and then is pulled back so that teeth on the flat side of the button catch in the tissue of the heart's dividing wall, or septum. The other half button is then fastened to the first half, and the instrument withdrawn.

A plastic ball for remedying another heart condition was devised by the same Georgetown surgeons.

Some 200,000 persons are living today with a valve on the aorta that does not close. The aorta is the biggest artery of the body, leading directly from the heart. It opens for blood to be pumped into the body. When it fails to close, much of the blood rushes back into the heart.

Common Heart Difficulty

This condition, call aortic regurgitation, is the fourth or fifth commonest type of heart trouble today. In order to pump blood when the aortic valve is faulty, the heart must work harder and harder.

To remedy this, the plastic ball is fastened into the aorta with nylon rings. When the blood is pumped into the big artery, the ball valve moves forward to let the blood through. However, if the blood starts to rush back into the heart, the ball valve moves back and closes the opening.

Other surgeons have devised various clamps for special purposes, among them some named "bull dog" clamps that Dr. Robert E. Gross of Boston originated. A "bull dog" clamp has a rubber well to close an abnormal opening in the wall between the heart auricles.

Knives, bone saws and curved needles are only the beginning of the tools used by modern surgeons. Scissors play a far more important part than most laymen realize. They are used not merely for cutting stitches and bandages. In operating on large blood vessels they are more useful than the scalpel, or knife, for cutting the blood vessel free from the tissue around it so that the surgeon can work on the damaged blood vessel.

Science News Letter, July 10, 1954

ASTRONOMY

Spot Comet in Southwestern Sky

➤ A COMET has been spotted near the constellation of Virgo, the virgin. It was discovered June 29 by Leslie C. Peltier of Delphos, Ohio, an amateur astronomer who is credited with having found a dozen or so comets.

The comet is of ninth magnitude, thus a telescope will be needed to locate it in the southwest sky. Its motion is south southwest, according to Harvard College Observatory, clearing house for astronomical news in the Western Hemisphere.

Science News Letter, July 10, 1954

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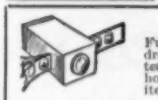

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ANNUAL REPORT OF THE NATIONAL TUBERCULOSIS ASSOCIATION, April 1, 1953 to March 31, 1954—James E. Perkins, Managing Director—*National Tuberculosis Association*, 56 p., paper, free upon request direct to publisher, 1790 Broadway, New York 19, N. Y. Commemorating half a century of organized nationwide action against a dread disease. Deathrate has been reduced from 188 per 100,000 in 1904 to only about 16 per 100,000.

CHEMICAL PATHWAYS OF METABOLISM, Volume I—David M. Greenberg, Ed.—*Academic*, 467 p., illus., $11.00. A survey of existing knowledge of the metabolism of major constituents of living organisms. Each chapter is by an individual actively working in the field.

CORONARY HEART DISEASE IN YOUNG ADULTS: A Multidisciplinary Study—Menard M. Gertler, Paul D. White and others — *Commonwealth Fund - Harvard University Press*, 218 p., illus., $5.00. Reporting findings of a three-year research program at Massachusetts General Hospital from which it is hoped that it may be possible in future to identify coronary-prone individuals with a view to preventing development of the disease.

DOCUMENTS ON GERMAN FOREIGN POLICY 1918-1945, Volume VIII, The War Years, September 4, 1939-March 18, 1940—Paul R. Sweet, Margaret Lambert and Maurice Baumont, Eds. in Chief—*Govt. Printing Office*, Department of State Publication 5436, 974 p., illus., $4.00. Documents from captured archives of the German Foreign Ministry and the Reich Chancellery.

GMELINS HANDBUCH DER ANORGAN ISCHEN CHEMIE: Schwefel Teil A System-Nummer 9—Gmelin Institute—*Verlag Chemie*, 8th ed., 252 p. illus., paper, $34.00. Devoted to the physics and chemistry of elemental sulfur.

HANDBOOK OF FOOD PREPARATION — Terminology Committee of the Food and Nutrition Division, American Home Economics Association — *American Home Economics Association*, 66 p., paper, 50 cents. A handy reference book for homemakers, students and all who deal with foods. Contains tables of weights and measures, cooking timetables, definitions and information about food properties.

INTRODUCTION TO MATHEMATICAL STATISTICS —Paul G. Hoel—*Wiley*, 2d ed., 331 p., illus., $5.00. Growing out of the author's course for junior and senior science majors.

MARINE POLYCHAETE WORMS FROM POINT BARROW, ALASKA, WITH ADDITIONAL RECORDS FROM THE NORTH ATLANTIC AND NORTH PACIFIC —Marian H. Pettibone—*Smithsonian*, 154 p., illus., paper, free upon request direct to publisher, Washington 25, D. C. Based on material collected in 1948, 1949 and 1950 by G. E. MacGinitie of the Arctic Research Laboratory.

MONOMOLECULAR LAYERS — Harry Sobotka, Ed.—*American Association for the Advancement of Science*, 207 p., illus., $4.25. Papers, presented at a symposium of the AAAS on Dec. 27, 1951, which give a cross section of recent progress in the field.

NEW FIBRES FROM PROTEINS—Robert Louis Wormell—*Academic*, 208 p., illus., $5.80. Putting forth a generalization of the "corpuscular theory" which, it is believed, may remove some of the confusion on protein fiber behavior.

PLATO'S MATHEMATICAL IMAGINATION: The Mathematical Passages in the Dialogues and Their Interpretation—Robert S. Brumbaugh—*Indiana University Press*, 302 p., illus., paper, $7.50, cloth $8.00. Advancing the theory that "mathematical" passages in Plato which have seemed nonsense or riddles to previous students in fact describe diagrams which Plato had designed. They illustrate and clarify the text of Timaeus and Republic.

PRODUCTION OF NATURAL GAS SUBSTITUTES BY PRESSURE HYDROGASIFICATION OF OILS—H. R. Linden, J. J. Guyer and E. S. Pettyjohn — *Institute of Gas Technology*, Interim report sponsored by the Gas Production Research Committee, 35 p., illus., paper, $2.50. In laboratory tests and in pilot plant tests, it has been possible to attain complete gasification of light distillates to make a substitute for natural gas.

THE ROLE OF COMPANY STANDARDS IN INDUSTRIAL ADMINISTRATION—Dickson Reck—*Mellon Institute*, 5 p., illus., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Discussing standardization and its problems.

SURVEY AND TREATMENT OF MARSH DEPOSITS —Fred Burggraf and W. J. Miller, Eds.—*National Academy of Sciences—National Research Council*, Highway Research Board Bibliography 15, 95 p., paper, $1.20. Making the experience of others more easily available to the student and practicing engineer.

TODAY'S REVOLUTION IN WEATHER — William J. Baxter—*International Economic Research Bureau*, 131 p., illus., paper $1.00, cloth $3.00. Intended to give you an idea of what changes in climate are doing among other things, to real estate values in California and Florida and to the water supply in Texas.

UNDERWATER PHOTOGRAPHY—Hilbert Schenck Jr., and Henry Kendall—*Cornell Maritime Press*, 110 p., illus., $3.00. A practical book for amateurs and others concerned with the problem of taking pictures through water.

WHY WE BECOME DOCTORS—Noah D. Fabricant, Ed.—*Grune & Stratton*, 182 p., $3.75. These medical autobiographies show that doctors are led into medicine partly by chance. W. Somerset Maugham, better known as a story teller than as physician, says that the medical profession is the best training for a writer. Hans Zinsser, by contrast, went into medicine because he doubted his talent at writing.

WIDE RIVER—Dorothy Childs Hogner—*Lippincott*, 64 p., illus., $2.00. A story for little children about "Little Chipmunk" and his difficulties with a wet spring.

WORLD GEOGRAPHY: An Introduction—Loyal Durand, Jr.—*Holt*, 372 p., illus., $5.25. Dealing not only with the elements of the natural landscape but also cultural elements—man's stage of civilization.

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ENGINEERING

Atomic Sub Outdoes Soviet A-Plant

▶ ANNOUNCEMENT BY the U.S.S.R. that a 5,000 kilowatt atomic power plant is operating will create little excitement in this country. (See p. 29.)

The Atomic Energy Commission has a large five-year atomic power program underway. There is no question about the feasibility of an atomic power plant for electrical generation. There has been no rush to build such power plants because atomic electricity would cost more than power from coal.

At least one power plant using fissionable material has proved itself and that is undoubtedly a couple of times bigger than the Soviet plant. This submarine engine prototype built and tested in Idaho has been running for some time. It does not produce electricity primarily, but is an atom-fired steam plant such as will be installed in the Nautilus.

PHYSICS

Atomic Power Plant

Private industry is making a start on production of electric power from fissioning atoms. Prices will not be competitive with power from other means.

▶ ATOMIC ENGINEERS are cautiously taking a bold step forward. They are working out an untried design for the world's first commercial, nuclear-fueled electric power house to be built near Pittsburgh.

Nothing like it has ever been built before. However, the pioneering engineers comfort themselves with visions of the future when radioactive uranium will turn mammoth turbines to make cheap electricity for your home.

They feel they now can domesticate the fearful atom and they want to give their ideas a whirl.

Although the actual design has not been proved, it was worked up from experience gained from the atomic engine for the nation's first nuclear-powered submarine. More experience spilled into this commercial design from a Navy project aimed at producing a suitable reactor to drive large ships.

Engineers feel confident that no nuclear explosion will shatter the tranquility of the wooded south bank of the Ohio River.

If something does go wrong, despite the safety devices that will be watching over the nuclear furnace, the explosion would not be like an A-bomb's, the Atomic Energy Commission reports.

It would be more like a large industrial explosion. Or it could be that the furnace would get too hot, melting some of the equipment and maybe spilling some of its materials.

The core of this furnace, which is to be built by Westinghouse Electric Corporation for the Duquesne Light Company about 25 miles northwest of Pittsburgh, will weigh more than 10 tons. It will be made up of natural uranium and the U-235 isotope.

It will be capsuled in a cylinder six feet in diameter and seven and a half feet in height. The reactor is designed to accommodate even larger cores in the future, if they seem desirable. It can accept cylinders up to nine feet in diameter and 25 feet high.

The 20,000 pounds of uranium, which contains slightly more of the U-235 isotope than of the natural element, will generate surface temperatures up to 636 degrees Fahrenheit. This is the boiling point of water under a pressure of 2,000 pounds per square inch.

Water at this pressure will circulate through three loops from reactor to a heat exchanger, carrying off enough heat to develop 60,000,000 watts of electricity. A fourth loop is held in reserve for emergencies. About 16,000 gallons of water a minute can be pumped through each loop.

No one expects this first atomic power plant to produce electricity at prices competitive with current rates. AEC officials say, however, they "hope" the cost will not be much higher.

So that various ideas can be tried out, a great deal of flexibility is being designed into the plant. With experimentation, engineers should learn how to improve future atom power plants and cut power generation costs.

The actual design is nearing completion, and ground-breaking should come sometime this fall, the AEC says. The whole project should be finished in about four years.

It is an $85,000,000 project, including the generating and substation equipment for which the Duquesne Light Company will pay. The company also is contributing $5,000,000 toward the development of the nuclear reactor. It will purchase steam generated by the nuclear reactor at eight mills for each kilowatt-hour of electricity it generates from it.

The latter arrangement will, it is claimed, "save" the government about $30,000,000, bringing the government's interest in the project to $50,000,000. The Duquesne Light Company also will man and operate the entire plant.

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MEDICINE

Potassium Level Clue To Muscular Dystrophy

➤ THE CRITICAL level of potassium in muscle cells may be the first important clue in the case of that mysterious crippler, muscular dystrophy.

Research by a group of doctors from the University of California at Los Angeles Medical School and the Los Angeles Veterans Administration Center has indicated that the critical level in muscle cells of potassium, a chemical thought to play a leading role in muscle function, may also be involved in other neuromuscular disorders whose causes are unknown.

The doctors speculate that during early stages of neuromuscular diseases a cellular defect, possibly inherited, may result in persistent leakage of potassium from muscle cells. A potassium level in the cells then may be reached, below which normal chemical activity necessary for muscle function is no longer maintained.

The doctors are investigating the possibility of administering potassium to make up possible deficits of the vital chemical in muscle cells. The problem is to insure that the cells retain the extra potassium. If this problem can be solved, relief may be in sight for victims of these neuromuscular diseases for which there is no known cure.

The research is being performed by Drs. William Blahd, Franz Bauer, Raymond Libby and Augustus Rose. The investigation is being supported by the Muscular Dystrophy Associations of America and by the organization's Los Angeles chapter.

Science News Letter, July 10, 1954

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HERPETOLOGY

NATURE RAMBLINGS

Gila Monster

➤ GILA MONSTERS are among the ugliest creatures alive. If the creatures were endowed with man's sensitivity to beauty and ugliness, it seems safe to say that the males and females would never be able to overcome their mutual repugnance, and the genus would simply die out.

Gila monsters belong to the genus *Heloderma*, and the two species are appropriately named *H. suspectum* and *H. Horridum*. To all but the most avid Gila monster-lovers (there are such people, as you will read further on), both species are equally suspect and horrid.

For one thing, the Gila monster enjoys the dubious distinction of being the only lizard known to be poisonous. It is no hit-and-run poisoner like the snake. Once it strikes, it hangs on with all the tenacity of a bad conscience. While maintaining a bulldog grip, the Gila monster works its jaws, apparently to insure that the venom from its grooved lower teeth gets into the wound.

In the Southwest where Gila monsters are found, some people possibly out of loneliness, make pets of them. It is said that after a few weeks of captivity, they become "reasonably tame" although they are still nervous and therefore not completely trustworthy.

However, one reptile expert says that, "after a few months this nervousness wears away. Then they are the personification of good nature, permitting themselves to be handled in the most unceremonious fashion, without the least show of temper."

He offers one caution: Basking in warm sunlight seems to have the effect of reviving in even the most domesticated Gila monster its former anti-social ways. A disturbed sunbather will bite the hand that feeds it or any other.

To scientists it is something of a puzzle just why the Gila monster should be poisonous. Although it is sometimes known to kill small animals like mice, its principal food is believed to be eggs of snakes and other lizards. Obviously, poison is not necessary for stealing eggs.

The Gila monster found in Arizona and New Mexico has a short stubby tail. Its color is pink or orange with contrasting marks in black. In the Mexican and Central American species the tail is longer, the head is all black, and the light color is pale yellow. This species is sometimes called the beaded lizard, with the more familiar name, Gila monster, being reserved for the United States species.

Science News Letter, July 10, 1954

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TECHNOLOGY

No Jet Engines For Monorail Trains

➤ MONORAIL TRAINS swinging from a single track high in the air will not use jet engines to swish them along at faster-than-subway speeds.

E. H. Anson and R. L. Kimball of Gibbs and Hill, Inc., New York, told the American Institute of Electrical Engineers meeting in Los Angeles that jets, and their internal combustion engine brothers, make too much noise and spew forth too many fumes.

If monorail rapid transit cars ever prove to be the answer to modern downtown traffic snarls, they will be driven electrically, the engineers speculated. Electric motors would reduce the monorail train's weight, and thus would help to cut costs.

Science News Letter, July 10, 1954

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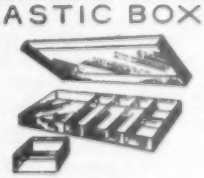

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MEDICINE

Chances of Getting Polio Related to Eye Color

▶ THE CHANCES of getting polio seem to be related to hair, eyes and skin color, at least for the Caucasian race.

An "unexpected correlation between susceptibility to poliomyelitis and genetic traits indicated by pigmentation" is reported in *Science* (June 25) by Dr. Wallace L. Minto of River Edge, N. J.

He studied 1,183 persons stricken with crippling infantile paralysis. Of these polio patients, only one had blonde hair, blue eyes and fair skin, and only 17 had blond hair and brown eyes. The remaining 1,165 had brown or black hair and eyes.

These ratios, he points out, differ "significantly" from the occurrence of light pigmentation in the general population.

Patients with fair complexion had relatively light cases of poliomyelitis, and only two of them suffered any permanent injury, his study showed.

Dr. Minto believes that the variation in polio susceptibility he found should be taken into account in any statistical study of the value of polio vaccines.

Science News Letter, July 10, 1954

Questions

ANTHROPOLOGY—Why may man-apes be dropped from man's family tree? p. 22.

□ □ □

GENERAL SCIENCE — How many scientists have been denied visas in the last two years? p. 24.

□ □ □

INVENTION — How does a curb-climbing wheelchair work? p. 21.

□ □ □

MEDICINE—What is electrophoresis? p. 22.

□ □ □

PHYSICS—Why is "cold" ice best for cool drinks? p. 25.

□ □ □

SURGERY—On what instrument do surgeons use white shoestrings? p. 24.

□ □ □

Photographs: Cover, American Airlines-Hayden Planetarium Eclipse Expedition; p. 19, Sylvania Electric Products, Inc.; p. 21, New York University; p. 23, Radio Corporation of America; p. 26, Fremont Davis; p. 32, Master Vibrator Co.

PSYCHOLOGY

Civilized Life Effects

▶ SOFT LIVING under civilized conditions is making men unfit for combat stress.

This is a possible implication of experiments reported to a symposium at the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Me., by Dr. Carl P. Richter of Johns Hopkins Hospital, Baltimore.

Dr. Richter worked with rats, not men, and measured the changes occurring when the vicious Norway rat was brought into the laboratory and bred under domesticated conditions. However, there is a possibility of similar changes in humans as a result of social living, he indicated.

Fighting makes changes in the body chemistry of rats, Dr. Richter found. Notable was a cutting down of adrenal lipids and other substances.

Comparable changes were found in men after combat, by a team of scientists working at the battle front in Korea; the stress of combat causes dehydration of the body and a shortage of adrenal hormones, they found.

The laboratory rat behaves differently from his wild cousins in Baltimore's alleys, Dr. Richter indicated. He is less ready to fight and he does not fear humans. He matures sexually at an earlier age, and he has not the same tendency to breed at certain seasons.

Physically, the laboratory rat's pituitary glands are bigger and his adrenal cortex is smaller. It is the adrenal gland, particularly, that helps the body to handle emergencies. Removal of pituitary, sex glands or adrenals has a much greater effect in reducing the activity of the laboratory animals than such operations have on wild rats.

Although these effects are produced by living and breeding in a laboratory environment, or, in the case of man, in a world of televisions, automobiles and innerspring mattresses, Dr. Richter does not attribute them to the inheritance of acquired characteristics as would the Russian scientists.

He concludes that the changes have occurred as the result of "conscious and unconscious selection for fertility and tameness." Probably the laboratory technician does not breed the wild rat that continually fights and bites the hands that feed him.

Science News Letter, July 10, 1954

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OUTDOOR ANTENNA kits equip the set owner with all the materials he needs to install his own outdoor antenna at about one-third the professional installation cost. One TV set manufacturer offers nine different kits to meet various reception conditions.

Science News Letter, July 10, 1954

DOUBLE-END FORK helps to get at the meat of lobster and other shelled seafoods. The utensil's red plastic handle holds a single tine at one end and two curved tines at the other. Rust and corrosion-proof, the fork is also handy for spearing olives and pickles.

Science News Letter, July 10, 1954

TEETHING RING of soft, water-filled cushions soothes baby's gums after the toy is cooled in a refrigerator. Made of non-toxic materials, it may be sterilized in boiling water. The ring is decorated with colorful circus animals.

Science News Letter, July 10, 1954

TRIPLE-AID repair kit holds 27 items designed to meet minor vacation emergencies. Included in the plastic, pocket-sized kit are first aid supplies, clothing repair equipment, tools, and those items picnickers often forget—knife, bottle opener, and cork screw.

Science News Letter, July 10, 1954

PORTABLE, MIDGET power trowel, shown in the photograph, finishes concrete many times faster than hand trowels. The tool's three blades sweep in a circular pattern and adjust for floating, sweat, smooth, or hard trowel finishes. Weighing less than 70 pounds, the gasoline-powered tool may be carried in one piece through doorways or down stairs.

Science News Letter, July 10, 1954

HEAT-REPELLENT PAINT, applied to a building's roof, reportedly may lower interior temperatures as much as 45 degrees. This "air-conditioning" paint reflects heat, light and infrared waves from its white surface. It has been applied successfully to steel, wood, aluminum, glass, asphalt shingle and masonry.

Science News Letter, July 10, 1954

WORD-GAME DECK is a playing-card version of popular word and spelling games that have swept the country. Conventional rummy and solitaire may also be played with the 52-card deck. Instructions give up-to-date rules for each game. A second deck for children has simplified, easy-to-understand rules.

Science News Letter, July 10, 1954

FOAM RUBBER seat is contoured to provide a more comfortable support for persons afflicted with ailments of pelvic and rectal regions. Having a scooped-out area that is said to help redistribute the body weight over a larger area, the seat may be used on any conventional chair or in automobiles.

Science News Letter, July 10, 1954

Gadget Bulletin

AMERICA'S PREMIER LISTING OF NEW MACHINES AND GADGETS

The GADGET BULLETIN is a post card with names and addresses of manufacturers and inventors of the products described on this page every week.

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7-10-4

Do You Know?

Nearly four tons of *aphids* have been found infesting a single acre of alfalfa.

Large male *snakes* will wrestle violently, attempting to strangle each other, when competing for a mate.

About 10% of the U. S. national income is spent each year for the purchase and operation of *automobiles.*

Half the *meat* produced in the world is beef and veal, four-tenths is pork, less than a tenth is mutton, and the rest is goat and horse meat.

Children are more likely to get contagious *diseases* at about five years of age than at any other time.

Flying *insects* usually attack the exposed parts of the human body; running and crawling insects, however, often bite in areas where their paths are impeded by tight clothing.

Japanese carpenter-architects three centuries ago developed features—such as multi-purpose rooms, combined outdoor-indoor living areas, and standardized parts—now regarded as new in American *houses.*